

WHAT IS CLAIMED IS:

1. An oscillating device comprising a movable plate, an elastic supporting part connected to the movable plate, a substrate connected to the elastic supporting part, and a coil, wherein the coil is  
5 disposed on the substrate, and the movable plate oscillates about the elastic supporting part by the action of a magnetic field generated by the coil.
- 10 2. The oscillating device according to claim 1, wherein a permanent magnet is disposed on the movable plate.
3. The oscillating device according to claim 2,  
15 wherein the coil is disposed on each of the front and back surfaces of the substrate.
4. The oscillating device according to claim 3,  
20 wherein the coil disposed on the front surface of the substrate and the coil disposed on the back surface of the substrate are electrically separated from each other.
5. The oscillating device according to claim 3,  
25 wherein the coil disposed on the front surface of the substrate and the coil disposed on the back surface of the substrate are electrically connected to each

other.

6. The oscillating device according to claim 2,  
wherein at least a part of the coil is in contact  
5 with the substrate with an insulating layer  
interposed therebetween.

7. The oscillating device according to claim 3,  
wherein at least one of the coils is formed on an  
10 additional substrate having an insulating layer  
formed thereon and is disposed so as to be bonded to  
the substrate, and the additional substrate has any  
one of a recess and a through hole to avoid  
interfering with the movable plate and a torsion bar.

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8. The oscillating device according to claim 7,  
wherein the additional substrate is a single-crystal  
silicon substrate, and the recess or through hole is  
formed by anisotropic etching.

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9. The oscillating device according to claim 2,  
further comprising an induced voltage detecting means  
of detecting an induced voltage generated in the coil  
due to an angular displacement of the permanent  
25 magnet.

10. The oscillating device according to claim 2,

wherein the coil is disposed in such a manner that at least a part thereof intersects with the elastic supporting part.

5           11. The oscillating device according to claim 2, wherein the substrate is a single-crystal silicon substrate.

10           12. The oscillating device according to claim 2, wherein the elastic supporting part has an X-shaped cross section.

15           13. The oscillating device according to claim 2, which is an optical deflector having a light reflection surface on the movable plate.

20           14. An optical scanner comprising: the optical deflector set forth in claim 13; and a light source, wherein a light from the light source is scanned by the optical deflector.

25           15. An electrophotographic image-forming apparatus comprising the optical scanner set forth in claim 14, wherein a surface of a rotating photosensitive member is irradiated with the light scanned by the optical scanner to form a latent image on the surface of the photosensitive member.

16. An image display apparatus comprising the optical scanner set forth in claim 14, wherein the light scanned by the optical scanner in a primary scanning direction is also scanned by another optical scanner in a secondary scanning direction intersecting with the primary scanning direction, thereby projecting a two-dimensional image.

17. A method of producing an oscillating device having a movable plate, an elastic supporting part connected to the movable plate, a substrate connected to the elastic supporting part and a coil, comprising the step of disposing the coil on the substrate, wherein the movable plate oscillates about the elastic supporting part by the action of a magnetic field generated by the coil.

18. The method according to claim 17, wherein the substrate is a single-crystal silicon substrate.

19. The method according to claim 17, further comprising the step of processing the substrate by crystal anisotropic etching to form the movable plate and the elastic supporting part at the same time.

20. The method according to claim 17, further comprising the step of forming a sacrificial layer on

the substrate, the step of disposing the coil on the substrate comprising the step of disposing a part of the coil on the sacrificial layer; and the step of removing the sacrificial layer after the step of  
5 disposing the coil on the substrate.